4:Powdermaker E-5 (1929-1930) 1931 OM10 Ireland OM10
Lesu

VOLUME III 1931

000

HUMAN BIOLOGY

a record of research

Edited by

RAYMOND PEARL

in association with

H. S. JENNINGS ADOLF MEYER ADOLPH H. SCHULTZ
CURT P. RICHTER and JOHN R. MINER

Managing Editor

BLANCHE F. POOLER

ADVISORY BOARD

ED. CLAPARÈDE
University of Geneva

CHARLES B. DAVENPORT
Carnegie Institution

S. R. DETWILER
Columbia University

E. M. EAST
Harvard University

EUGEN FISCHER
Kaiser Wilhelm Institut für Anthropologie, Berlin-Dahlem

CORRADO GINI
R. Université de Roma

MAJOR GREENWOOD
School of Hygiene and Tropical Medicine, London

SHINKISHI HATAI
Tôhoku Imperial University, Sendai

ALEŠ HRDLIČKA
Smithsonian Institution

ERNST KRETSCHMER
Universitäts-Nervenklinik Marburg

H. LUNDBORG
Statens Institut för Rasbiologi, Uppsala

BRONISLAW MALINOWSKI
London School of Economics

D. PEYRONY
Musée Préhistorique, Les Eyzies (Dordogne)

P. RIVET
Muséum National d'Histoire Naturelle, Paris

JOHN B. WATSON
New York

CLARK WISSLER
American Museum of Natural History

[title page]

THE JOHNS HOPKINS PRESS, *Publishers*
BALTIMORE, MARYLAND, U. S. A.
1931

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

VITAL STATISTICS OF NEW IRELAND (Bismarck Archipelago) AS REVEALED IN GENEALOGIES

BY HORTENSE POWDERMAKER[1]

Institute of Human Relations, Yale University, New Haven, Conn.

INTRODUCTION

121 The purpose of the following study was to obtain birth and death rates which would show whether the native population is declining and, if it is, whether the decline is due to a low birth rate, a high mortality rate, or both. Sex ratios at birth and at the time of reproduction were also obtained.

121 114 The statistics were collected in a Melanesian community in New Ireland, (one of the islands in the Bismarck Archipelago and part of the Mandated Territory of New Guinea) where the writer lived for ten months. One linguistic unit, consisting of five villages on the east coast, about eighty miles from the northern end of the island, provided the material for the ethnological research. The villages were Ambwa, Lesu,[2] Langania, Libba and Tandis, and their total population is approximately 1,200. Residence was established in the village of Lesu, with a population of 222, and the bulk of the statistics were collected there.

METHOD

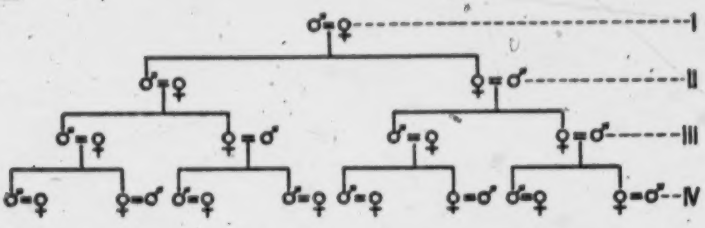
[126] Four hundred and fifty-five women and their offspring are the basis of the study. The statistics were collected by the genealogical method and figures for three generations were thus obtained. The results show 121 the trend for approximately the last hundred years. The genealogical method serves as a means for the comparison of age groups. Among a

[122] [1] The ethnological field work was done in 1929-1930, under the auspices of the Australian National Research Council and the author is now a Fellow of the National Research Council (U. S.), under the sponsorship of Dr. Clark Wissler.

[2] The spelling on government publications is Lossu. The spelling used in this text more closely approximates the native pronunciation of the word.

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

stone-age people, where the unit of a year is unknown, and where there is no record of ages, written or otherwise, this is a way of getting around the question of age. One can, through the use of genealogies, classify everyone according to generation. Thus, given a number of genealogies, such as



all those on the line with *I* are in one generation, those on the line with *II* in another, and those on the line with *III* in still another, and so on.

The generations have been indicated as follows: Those persons in generation *I* are a past generation in which the women are dead. The generation described as *II* are the children of *I*, and the women are old, past the childbearing period. Number *III* are the children of *II* and are women who have reached their menopause. The group known as number *IV* are young women whose marriage is of more than one year's duration and who are in the childbearing period, frequently in the beginning of it. This group can be used only in a limited manner. The sex, name, clan, order of birth (first, second, or third born, etc.), approximate time of death and various other ethnological facts were recorded for each person in the genealogies.

Because of the lack of a calendar and complete ignorance of their chronological age, intervals of time have to be calculated from the physiological crises occurring in the life history of an individual. The lactation period lasts from two to three years. The period of childhood indicates the time between the end of the lactation period and the beginning of puberty, approximately between the ages of two and a half or three and thirteen.[8] Youth covers the period from the end of childhood

[881]

[8] The average age for the beginning of menstruation in the tropics is said to be 12.9 years. See Carr-Saunders, A. M.—*The Population Problem*, 1922, Oxford, p. 91.

For the boy there is no such clearly marked physiological end of childhood. Circumcision occurs, roughly, any time between the ages of about eight and twelve, or thirteen. It is a communal rite, held when the necessary food and wealth have been accumulated, and all the boys of the village within these age boundaries are circumcised at one time.

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

to about sixteen, and by young manhood and womanhood is meant the time between the end of youth and the early twenties. These, of course, are only generalizations.

Since the main object is to determine infant and childhood mortality rates, and survival rates at the time of reproduction, death rates are calculated only for the period up to marriage. The point is to find out how many people survive until the time when they can reproduce themselves. It must therefore be remembered that the total number of deaths is always the total number occurring before marriage. Moreover, in the genealogical method, where in one classification all the principals are dead, this is the only feasible procedure.

It is obvious that there will be a certain amount of error in any vital statistics collected among a people where there are no records of birth and death, but the importance of real and classificatory relatives, the rather formalized pattern of behavior between them, and the elaborate pregnancy, birth, and death rites, and interclan marriages, enables a Melanesian native to give a fairly accurate genealogy. It may be also that the very absence of written records throws a heavier burden upon the individual's memory, which he does not shirk. But it is obvious that no matter how good the memory of Melanesian informants, errors in these data must exist. They are, however, in the nature of the material and would probably exist in any study made on a similar primitive people. As far as possible, these errors are indicated in the description of the tables, which, it should be understood, denote general trends rather than exact statements. The genealogical method, while taking much more time than the census method, enables one to separate the subjects into age groups and presents a more comprehensive prospective over a longer period of time. But because of the great amount of detailed work and time involved in the use of this method, it is only practical for a small unit of people.

The nearest comparable figures are those of the recent government census taken in 1929 for a part of the east coast of New Ireland (from Kavieng to the village of Karu, approximately 147 miles beginning at the northern end of the island) and which includes over a larger area the people designated in this study as generations II, III, IV, but excludes those in generation I (the dead).[4] The results of the government

[4] Chinnery, E. W. P.—*Anthropological Report*, No. 6, Territory of New Guinea. In print.

4: Powdermaker 5-6 (1929-1930)1931 OM10 New Ireland OM10
Lesu

127 census are compared whenever possible to the results of this genealogical study of a smaller unit of the same people, for the purpose of checking the accuracy of the latter study.

ETHNOLOGICAL FACTS

105 Before presenting the tables it is pertinent to give a few ethnological facts related to the statistics. This group of Melanesians are an agricultural, matrilineal and matrilocal people, with exogamous moieties subdivided into clans. There is no scarcity of land, which is communally owned, and getting sufficient food is not difficult, although it requires a certain amount of industry. The diet is limited, taro being the staple food. This is supplemented by fish, pigs, yams, bananas, pawpaws, coconuts, etc.

582 Sexual customs have an important bearing on the statistics. A girl is usually married directly after her first menstruation. A man's preferred mate is the mother's brother's daughter's daughter, or the father's sister's daughter's daughter, and he is thus of a generation above his wife. While the preferred marriage quite frequently does not take place, the husband is almost always older than his wife, usually a difference of about five to ten years. The girl has had no sexual intercourse, although she has indulged in sexual play, but the man, being some years past puberty, has had sexual experience previous to the time of his marriage. There are no unmarried women. There may be a couple of young widows in the community, but it is just a question of time before they remarry. Both husband and wife have extra-marital intercourse and there is no social stigma in having lovers or mistresses. Rather, it is the correct thing to do. The husband of the mother is always the sociological father of her children. Until very recently it was quite usual for a man to have two wives and this had been the case with most of the married men of my community. It was relatively rare for a woman to have two husbands, although it did and still does happen occasionally. Missions have taught a monogamous system of marriage, with partial success. Polygamy still exists, but not to the same degree or extent as it did a generation ago. White contact has scarcely affected extra-marital intercourse. Should the village be close to a mission center (mine was not) love affairs would simply be carried on more surreptitiously.

836 [587] 837 [851] 545 797 [595] [837]

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

surreptitously. Divorce is moderately common and individuals may have a succession of mates.

During the period of pregnancy a women may have no sexual intercourse with her husband or anyone else. The man may, however, have sexual intercourse with a woman other than his wife. After the birth of the infant neither the mother nor her husband may have intercourse with each other, or with anyone else, during the period of lactation. For the women there is thus an abstention from sexual intercourse for a minimum of three years and for perhaps as much as four. This taboo, if kept, would cause a long interval of time between births. It is difficult to find out exactly how strictly it is kept. Like all taboos in primitive societies it is sometimes broken. But one cannot collect statistics on the subject because one only hears of the cases when the culprits are found out. After living in the society for almost a year, the writer is of the opinion that it is kept moderately strictly. There is a grave social stigma for those who break it and are found out, and their infant is supposed to become ill. One such case happened during the author's visit and was the cause of much gossip. It was known that the parents of a certain sickly infant had broken the taboo and the natives all pointed to their unhealthy infant as the result. It is more difficult to break this taboo and not be found out than it is for a member of our society to transgress our custom of monogamy and not be caught. In the primitive society under discussion there are several conditions which make secrecy difficult. First, the village is small, numbering only a couple of hundred, and everyone knows everyone else well. Secondly, practically all of the social life is carried on outdoors, and extra-marital intercourse generally takes place in the bush, which limits somewhat the privacy. Thirdly, these people, like all others, love to gossip and indulge in it to a great extent. It is therefore not easy to conceal a violation of this taboo. The social disgrace of being detected, and the belief that it will harm the child, are strong deterrents in a society motivated largely by social prestige.

There is no infanticide and, as far as I know, no physical means of abortion. There is, however, a leaf, or rather several leaves, chewed by the women and believed to cause sterility. There is another leaf which if chewed within two months after conception will make the embryo disappear, according to native belief. Specimens of both kinds

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

of leaves were obtained, but the writer has not yet had the opportunity of having them identified. Sterile women seriously attribute their sterility to the use of these leaves, and natives swear by their efficacy. But so do they also swear by their ability to make it rain by magic.[8]

Women usually work in their gardens right up to the time of giving birth to the child. Occasionally they may slacken their labor a bit a month or so before the time of birth, but this is not the rule. They resume their work usually about two weeks after birth. The long period of lactation has already been mentioned. In addition to the mother's milk, the infant is fed on baked taro within a day or two after birth. The mother chews it first and then gives it to the infant. There are other practices and customs which indirectly have a bearing on the vital statistics, but in this paper only the obvious ones can be indicated.

Household Census

Before presenting the statistics, a household census for one village (Lesu) is given. The household corresponds roughly to the individual family and its usual occupants are husband and wife, female unmarried children and young male children. Should a man have two wives, each one will usually have her own home, but sometimes they share the same house, particularly if there is much discrepancy in their ages. Should a woman have two husbands, one of them will usually count the men's house as his home. The unmarried men and boys of from approximately ten years sleep in the men's house. But this does not prevent the young boys from eating with their family and being a part of the household as far as sharing its duties and pleasures. Married men, for various reasons, occasionally sleep in the men's house. The girls sleep at home until they are married, and there is no women's house corresponding to the men's house. An older relative (widow or widower), too feeble to live alone, may also be an occupant of the household.

The village of Lesu contained 66 households. There were 62 adult males and 63 adult females (all married), and 65 male children and 42 female children. Nine of the adult males and two of the females were

[8] Dr. Hrdlička investigated certain objects which Indians believed would cause artificial sterility. He found them ineffectual. Hrdlička, A., Physiological and Medical Observations among the Indians of Southwestern United States and Northern Mexico. Bureau of American Ethnology, Bulletin 34, p. 165.

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

working on coconut plantations. Among the adults there were six widowers and seven widows (mostly old). There was thus a total population of 222 (eleven of whom were absent) living in 66 households.

RESULTS OF THE STUDY

Birth Data

Table 1, which follows, presents the average number of offspring for all women and for each fruitful woman for three generations. As noted earlier, the females studied were divided into four groups according to their generation, those called *I* being dead, *II* old, *III* middle-aged, and *IV* young. The last group is omitted from the following table because the women are too young to have completed their childbearing period. Those unions in which the marriage was of short duration because of divorce or the death of the husband, (and no record was found of the woman's subsequent re-marriage), and those in which the woman died before the end of her childbearing period are omitted. The number of the former are 17 and the latter 23.

TABLE 1

Birth Rates

GENERATION	TOTAL NUMBER OF WOMEN	NUMBER OF OFFSPRING	AVERAGE NUMBER OF OFFSPRING PER WOMAN	NUMBER OF FRUITFUL WOMEN	AVERAGE NUMBER OF OFFSPRING PER FRUITFUL WOMAN
I	150	431	2.8 ± .119	142	3.
II	90	194	2.1 ± .159	74	2.6
III	55	150	2.7 ± .26	44	3.4
Totals	295	775	2.6	260	2.9

From the above table it appears that the people studied have had a practically stable birth rate for three generations: an average for the three groups of 2.6 per woman and 2.9 per fruitful woman. This is slightly higher than the rate given in the recent government census, the average issue per union being given there as 2.0 and per fruitful union as 2.7.[6] If the issue rate of generations *II* and *III* (which cor-

[6] Chinnery, E. W. P.—Anthropological Report, No. 6, Territory of New Guinea. In print.

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

responds more closely to the people on whom the government census was taken) is averaged, the difference between that and the rate given in the census is even less.[1] Since there is such close agreement between the figures computed by two different methods, it would seem that the issue rate, at least for the women of generations *II* and *III*, is fairly accurate. But there are no comparable figures for the issue rate of the women in generation *I*, and it is here that there is the largest possibility of error, because the principals are dead and could not be used as informants.

If the women of all three generations are classified according to their number of offspring, as in the following table (No. 2), it will be seen that the birth rate for the larger number of women is slightly higher than the average rate as given in Table 1.

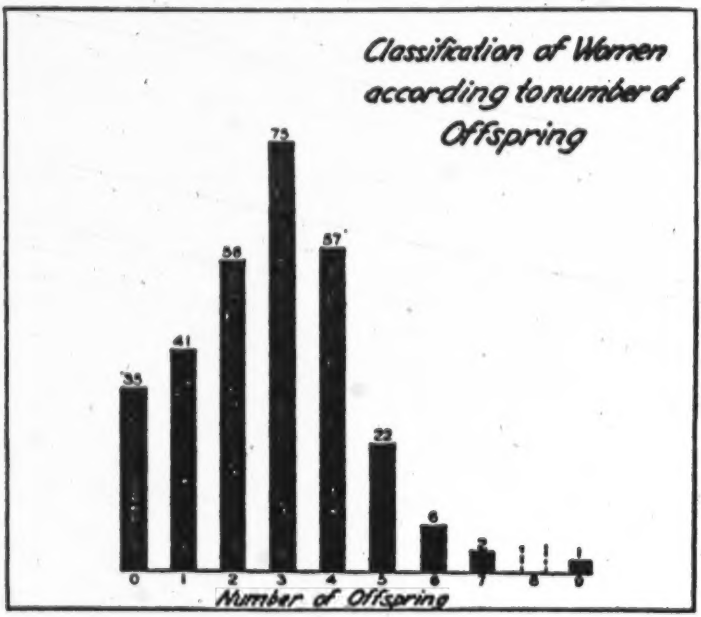


CHART I

[1] The difference is 0.4 per woman and 0.3 per fruitful woman.

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

TABLE 2

Distribution of Women by Number of Offspring

163

											TOTALS
Number of women	35	41	56	75	57	22	6	2	0	1	295
Per cent of women	11.8	13.9	19.	25.4	19.4	7.4	2.	0.7		0.3	99.9
Number of offspring	0	1	2	3	4	5	6	7	8	9	775

Of the 295 women, the largest group have three children and the next largest groups have four and two offspring respectively. Very few of the women have more than five offspring.

While the average issue rate for the women of this study seems very low, it does not vary very much from the rate of fecundity for the native-born women in the United States in recent times. Statistics on this subject are available only for certain sections of the country and for certain classes of people. In 1905, in Rhode Island, the average number of children born to native-born married women was 2.06 and to foreign-born married women 3.35.[8] From the census of 1900 a study of fecundity was made for the region including the state of Rhode Island, the cities of Cleveland and Minneapolis, 48 mainly rural counties of Ohio, and 21 mainly rural counties of Minnesota. The women of native white parentage had 2.7 children, while those of foreign parentage had 4.4 children.[9] The number of children per married couple of Yale graduates in the period 1881-90 was 2.04.[10] (The fertility of foreign-born stock in the United States is much higher and ranges from 6.2 for the Poles, to 3.4 for the English.[11]) It would seem that the fecundity of the Melanesians in New Ireland, while low, is about equal to that of the native-born whites of this country. Now, according to Carr-Saunders, fecundity has increased with civilization. He presents no statistical evidence for this theory, but he gives much suggestive evidence from primitive people all over the world.[12] The low rate of fecundity among the native-born white women of the United States is probably due to the use of contraceptives and cultural factors, such as

163
171

[8] Holmes, S. J., The Trend of the Race, *N. Y.*, 1921, p. 125.
[9] *Ibid.*, p. 127.
[10] *Ibid.*, p. 136.
[11] *Ibid.*, p. 128.
[12] Carr-Saunders, A. M., The Population Problem, *Oxford*, 1922, pp. 92-105.

Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

163 [171] economic conditions, time of marriage, etc., and does not therefore invalidate Carr-Saunders' theory.

Although it is not absolutely certain, it appears that the people of this study have maintained a stable birth rate over three generations, yet at the same time there seems to be an increase in the percentage of sterile women. If the number of sterile women are grouped according to their generation, the percentage of sterility over the three generations can be measured. Table 3 presents this.

TABLE 3

Sterility Rates

GENERATION	NUMBER OF STERILE WOMEN	PER CENT OF WOMEN WHO ARE STERILE
I	8	5.3
II	16	16.6
III	11	20.
Totals	35	11.8

It can be seen that the percentage of sterile women jumps from 5.3 per cent to 20 per cent in three generations.[18] There is not the same possibility for error in this rate as there is in the issue rate for the women of generation *I*, for if the informants forgot to give children of these dead women, it would have made the sterility rate higher than it should be and the corresponding increase in sterility to the present time would be still greater. The same fault of memory would have made the fecundity of these women lower than it should be, and there is thus the possibility that the birth rate may have declined instead of being stable. The error could only be one way and we know therefore that the birth rate has not increased.

163 164 It is the opinion of the writer that the low rate of fecundity and the increase of sterility among these Melanesian women may be due to the introduction of syphilis and gonorrhoea, usually the accompaniment

[18] cf. Pitt-Rivers, G. H. L. F., The Clash of Culture, *London*, 1927, Table IV, Appendix II, taken from Indian Population of the U. S. and Alaska, 1910, p. 157. The sterility for North American Indian and mixed-blood women between the ages of 15 and 44 years, and married one year or more, varies from 4.3 to 16.6, the highest percentage falling among the marriages of full-bloods.

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

of white civilization. Gonorrhoea is considered the cause of a large percentage of sterility, and when not causing complete sterility frequently limits the family to one or two offspring. There is a difference of opinion on the effect of syphilis on the pregnant woman and her offspring, but there appears to be evidence that syphilis tends to reduce the number of pregnancies. In a study made on syphilitic and non-syphilitic families, the number of pregnancies in syphilitic families was 2.58 compared with 3.8, 4.4 and 5.5 in non-syphilitic families.[14] The evidence for the presence of these diseases among this people, and their further connection with the vital statistics will be discussed in the latter part of this paper. Here it is only necessary to indicate a possible relationship between them and the birth and sterility rates.

Death Data

Having learned that the birth rate has not increased, i.e., that it is either stable or declining, it is of interest to note the death rate for the same people. The following table presents the number and percentage of those born in each of the three generations who died before marriage. The time of death is indicated by the physiological periods described in the introduction.

TABLE 4

Death Rates Based on Number of Births

GENERATION	BORN DEAD		DIED DURING LACTATION PERIOD		DIED DURING CHILDHOOD		DIED DURING YOUTH		DIED AS YOUNG MAN OR WOMAN		TIME OF DEATH UNCERTAIN		TOTAL DYING BEFORE MARRIAGE	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
I	1	.2	13	3.	25	5.7	11	2.5	17	3.9	19	4.3	86	19.5
II	1	.5	11	5.4	12	5.9	3	1.5	1	.5	2	.1	30	14.9
III	3	1.8	24	14.9	6	3.6	2	1.2	4	2.4	1	.6	40	24.3
IV	1	.5	29	16.3	..	...	..	...	..	...	..	...	..	...
Totals	6	.6	77	7.9	43	5.4	16	2.	22	2.7	22	2.7	156	19.5

There has been an increase in the mortality over the three generations. Among the offspring of generation *I*, 19.5 per cent of those born died before reaching the age of marriage, while 24.3 per cent of the children of group number *III* have already died before marriage. This

[14] Solomon, H. C. & M. H.—Syphilis of the Innocent, *Washington*, 1922, p. 128.

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

165 percentage will probably be still higher in a few years, as all the children of these women have not yet had time to reach the marriageable age. There is a decrease of 4.6 in the per cent of all deaths occurring before marriage for the offspring of group number *II* as compared to the offspring of number *I*. Of this decrease 4.4 per cent occurs in the two periods of youth and young manhood, or in the interval between the end of childhood and time of marriage. If Table 7, giving the sex ratios for these periods, is consulted it will be seen that there is a much smaller percentage of masculinity during this interval (i. e. from the end of childhood to the time of marriage) for the offspring of number *I* than for the offspring of either of the other two generations. This means that a larger per cent of males among the offspring of number *I* died during this period than among the offspring of number *II*. It is probable that a large number of these male deaths among the children of number *I* were due to warfare, which was abolished by the mandated government about the time the children of number *II* were growing up. One can therefore assume that the decrease in mortality rate for the offspring of number *II* as compared to the preceding generation is due to the abolishment of warfare. On the other hand the same absence of warfare is operative as an influence on the mortality rate for the children of number *III*, and yet there is an increase of almost 10 per cent in the death rate before marriage for the children of this group over the preceding generation.

Before discussing in more detail the death data, it is necessary to give the following table, which shows the percentage of total deaths before marriage, occurring during the different physiological periods. This brings out more clearly than the preceding table the distribution of deaths from birth to time of marriage.

TABLE 5

Percentage Distribution of Total Deaths Before Marriage

GENERATION	BORN DEAD	DEATHS DURING LACTATION	DEATHS DURING CHILDHOOD	DEATHS DURING YOUTH	DEATHS DURING YOUNG MANHOOD AND WOMANHOOD	TIME OF DEATH UNCERTAIN
I	1.1	15.1	29.	12.8	19.7	22.
II	3.3	36.6	40.	10.	3.3	6.6
III	7.5	60.	15.5	0.5	10.0	2.5
Totals from generations I and II	1.7	20.6	31.9	12.	15.5	18.1

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

165

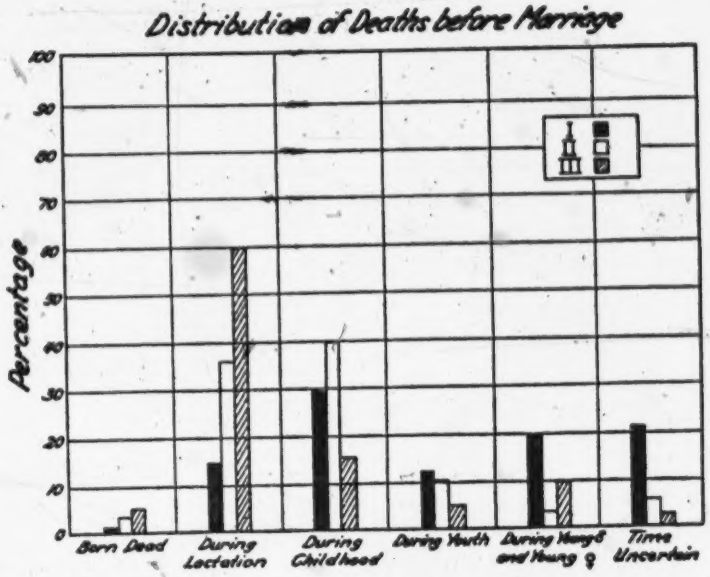


CHART II

There is a marked increase in the per cent of total deaths occurring during lactation. It must be noted, however, that the time of 22 per cent of the deaths occurring before marriage among the children of generation number *I* was not known to the informants. Assuming that the whole 22 per cent occurred during the period of lactation, which is possible, there is still an increase of 23 per cent of the total deaths which occurred during lactation for the offspring of group *III*, as compared with the offspring of group number *I*. For reasons already indicated, it is possible that there may be an error in the mortality rate as well as in the issue rate for generation number *I*. It will be wiser, therefore, to compare the mortality rates during lactation for the offspring of generations *II* and *III*, which are considered more accurate because the principals are all living and because the statistics concerning them compare so closely to the recent government census.[18] There is an increase of 24 per cent in the deaths occurring before marriage which take place during lactation for the offspring of group number *III* as compared to the offspring of group number *II*. This increase be-

[18] Chinnery, E. W. P.—Anthropological Report, No. 6, Mandated Territory of New Guinea, (in press) gives an infant mortality rate of 19 per cent as compared

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

comes 20 per cent, if in both cases the per cent for which the period of death is unknown is supposed to have occurred during lactation. Comparing any of the three generations, it is clear that there has been an increase in mortality during the lactation period.

Table 6, which follows, presents the percentage of deaths of offspring arranged according to their order of birth. The percentage is

TABLE 6

Percentage Ratio of Deaths in Infancy and Childhood to Births by Birth Order

	1ST BORN	2ND BORN	3RD BORN	4TH BORN	AFTER 4TH BORN
Totals for all four generations	20.9	17.1	11.9	8.2	3.

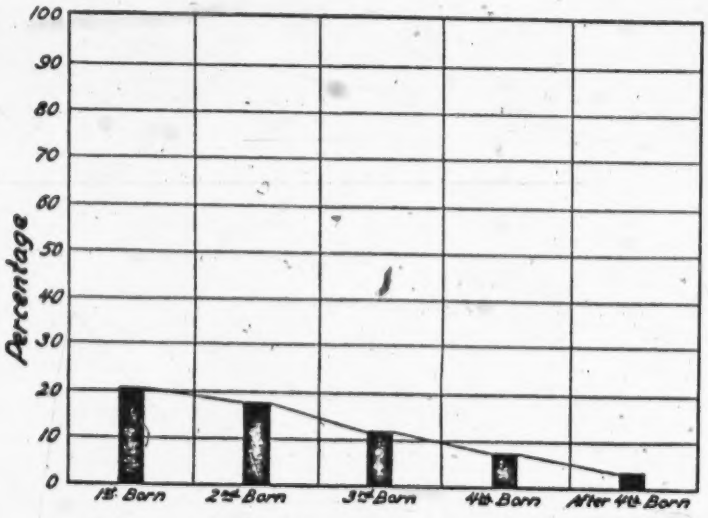


CHART III

PERCENTAGE OF DEATHS ARRANGED ACCORDING TO THEIR ORDER OF BIRTH
The percentage is based on the total number of deaths from birth to end of childhood.

---

to 16.4 per cent for the children of generation number III and to 17.5 per cent for the children of generation number IV of this study.

In the United States the mortality rate for the period from birth to the age of three years is 14.9 per cent. Computed from United States Life Tables, Dept. of Commerce, Bureau of the Census (based on the mortality rates for both sexes in the Original Registration States for 1910).

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

based on the total number of deaths occurring from birth to the end of childhood for all four generations. These percentages are based on incomplete numbers, as this kind of recording was done only during the latter part of the writer's expedition, and therefore for a limited number of genealogies. But they are sufficient to show the general trend.

This table shows that the infant mortality is higher for the first and second born than for those born later. Vital statistics for other peoples show this same tendency.

Considering the death data, it is quite obvious that there has been a decrease in the number of people surviving until the age of reproduction, because more of them are dying during the period of lactation. Since there has been no increase in the number of births, there must be a decline in the population. It is difficult to ascertain the cause for this increase in infant mortality when there are no records of the causes of death. Once again, it is probable that the cause of death might be traced to the introduction of white man's diseases. This will be discussed more fully in the Summary, but here it is important to note that tuberculosis is one of the introduced diseases which might account for the heavy increase in infant mortality. It is generally agreed that if the mother is tuberculous the chance for the infant living is very much lessened.[16] Also, a large percentage of mortality from tuberculosis occurs with young children.[17]

Syphilis, another introduced disease, tends to increase the deaths due to accidents of pregnancy, such as abortions, miscarriages and still-births.[18] It must be remembered that premature births, or abortions,

---

[16] Woodbury, R. M.—Causal Factors in Infant Mortality, U. S. Dept. of Labor, Children's Bureau, Pub. No. 142, p. 35.

[17] Bushnell, G. E.—A Study in the Epidemiology of Tuberculosis, *New York*, 1920, p. 163.

[18] Solomon, H. C. & M. H.—Syphilis of the Innocent, *Washington*, 1928, p. 128. cf. Jean, P. C.—Syphilis and its Relation to Infant Mortality, *Am. Jour. of Syph.*, Vol. III, No. 1, 1919, p. 122. "In a syphilitic family 30 per cent of the pregnancies terminate in death at or before term, a waste three times greater than is found in non-syphilitic families."

Cf. also Williams, J. W.—The Significance of Syphilis in Prenatal Care and in the Causation of Foetal Death, *Bull. of the J. H. H.*, Vol. XXXI, No. 351, May, 1920, pp. 142-145. In a study made on the causes of 302 foetal deaths, 89.3 per cent of the deaths are attributable to 7 groups of causes, of which syphilis is the most important as it accounts for 34.44 per cent of the total number.

4: Powdermaker F-5 (1930-1939) 1931 OM10 New Ireland OM10
Lesu

would be given to the writer as ordinary births and deaths. The pregnant woman loses count of the number of months she is pregnant and there was therefore no way of distinguishing between abortions and ordinary deaths occurring at birth. The percentage of those born dead thus includes abortions. It is interesting to observe that there was an increase in the percentage of those born dead over three generations. But on the other hand, this might also be due to a more accurate recording for the present than for the past, and since the numbers are small these percentages would be easily upset by a greater degree of accuracy for the recording for generations *II* and *III*, than for *I*. The presence of syphilis would not only account for an increase in foetal deaths, but it might also be a cause of infant mortality. In one study it was found that "Thirty per cent of all the living births in a syphilitic family die in infancy, as compared to a normal rate of 15 per cent in the same class." [19] Again, if the infant himself has syphilis he has just half the expectation of life of a non-syphilitic infant.[20]

Other theories accounting for the decline of native populations, and a fuller discussion of the subject of introduced diseases will be given in the Summary.

Sex Ratios

The connection of sex ratios with a declining population is also of interest. Pitt-Rivers has drawn attention to the significance of sex ratios by his theory that an increasing masculinity occurs when a people is dying out or declining.[21] He points out that it is more important to know the sex ratios for those surviving at the time of reproduction than the sex ratios at birth. The following table gives both.

Table 7 gives the sex ratios at birth, at the end of childhood, and at the time of marriage. The percentage is based on the total number—both sexes—at each one of these periods. Eight offspring were not counted because their sex was not known to the ethnologist.

---

[19] Jean, P. C.—Syphilis and Its Relation to Infant Mortality, *Am. Jour. of Syph.*, Vol. III, 1919, p. 122.

[20] *Ibid.*, p. 120.

[21] Pitt-Rivers, G. H. L. F.—The Clash of Culture, *London*, 1927, Supplement on Sex Ratios, *passim*.

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

162

TABLE 7

Sex Ratios

GENERATION	AT BIRTH			AT END OF CHILDHOOD			AT TIME OF MARRIAGE		
	Per cent of ♂	Per cent of ♀	Diff.	Per cent of ♂	Per cent of ♀	Diff.	Per cent of ♂	Per cent of ♀	Diff.
I	53.9	46.1	+ 7.8	54.4	45.5	+ 8.9	51.1	48.8	+ 2.3
II	58.3	40.7	+17.6	57.2	42.7	+14.5	55.7	44.3	+11.4
III	53.4	46.5	+ 6.9	56.5	43.4	+13.1	54.9	45.1	+ 9.8
IV	54.7	45.3	+ 9.4	...	...	.....	...	...	.....
Totals	55.	45.	+10.	55.5	44.4	+11.1	53.	46.9	6.1

\+ Indicates excess of males.
— Indicates excess of females.

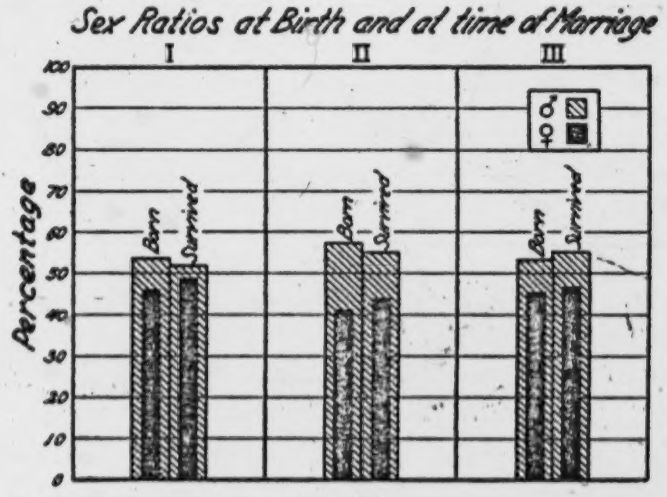


CHART IV

In all four generations there are more males born than females, which is true of most peoples. At the time of marriage there is still an excess of masculinity, but less than there was at birth. It must, however, be remembered that the male is older than the female at the time of marriage and that there is accordingly more opportunity for him to die before marriage.

4: Powdermaker E-5 (1929-1930) 1931 OM10 New Ireland OM10
Lesu

162 Table 8 must be presented before continuing the discussion of Sex Ratios. The following table gives the percentages by sex for those surviving until the end of childhood and the time of marriage. The per cent is based on the number of each sex born.

TABLE 8

Ratio of Individuals of Each Sex Surviving

GENERATION	PER CENT OF MALES BORN SURVIVING UNTIL END OF CHILDHOOD	PER CENT OF FEMALES BORN SURVIVING UNTIL END OF CHILDHOOD	DIFF.	PER CENT OF MALES SURVIVING UNTIL MARRIAGE	PER CENT OF FEMALES SURVIVING UNTIL MARRIAGE	DIFF.
I	91.9	90.	+ 1.9	76.	85.	— 9
II	85.3	91.3	— 6	80.1	91.3	—11.2
III	84.8	74.6	+10.2	77.9	73.3	+ 4.6
IV	81.7	72.7	+ 9.	...	...	.....
Totals	88.7	87.	+ 1.7	75.5	83.9	— 8.4

If the generations are considered separately there is a difference between them in their sex ratios. There is a much higher excess of males at birth among the offspring of generation *II* than among the offspring of any of the other generations. (Table 7.) The writer is unable to find any reason for the unusually high masculinity of the former group. As if to make up for it, there is a higher rate of mortality in childhood and youth among the males of this group than among the females, while among the offspring of generations *I* and *III* the opposite condition exists. (Table 8.) Another inconsistency is that the male mortality rate for the whole period from birth to marriage is greater than the female mortality rate for the same period among the offspring of generations *I* and *II*, while among the offspring of group *III* the mortality rate is less for the males during this period. Again no adequate reason can be given. Where the numbers are small, any incidental factors, such as the outbreak of some particular disease affecting one sex more than the other, might easily change the ratios. An error might also lie in the recording, and it may be that an apparently unusual excess of masculinity might be because of the fact that some informants remembered males better than females. On the other hand, to offset this, it must be remembered that this study was made in a matrilineal society,

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

with inheritance of clan and property in the female line. There are therefore more practical reasons to remember females than males. 162

However, the sex ratios with their apparent inconsistencies are presented for what they are worth. There is no ambiguity about the fact that there is a higher masculinity at birth and at the time of reproduction for this particular group of a declining people.[23]

SUMMARY

The people on whom this study was made are generally considered to be a part of a group which is dying out. Pitt-Rivers says that, "Nowhere in the Pacific is the phenomenon of the disappearance of the aboriginal races more noticeable than in the islands of the Bismarck Archipelago, where European control last made its influence felt."[23] The same author notes that the decline has been even more marked in New Ireland and New Hanover than on some of the other islands.[24] The population of the Kavieng district of New Ireland, which includes the larger part of the east coast, was counted as 14,749 in 1914 and as 13,289 in 1921, a difference of 1,460 in seven years.[25] There is another report which covers the period 1928-29.[26] Mission stations are responsible for the latter figures, which refer only to those sections under mission control, and can be used merely to indicate a general tendency. For the Kavieng district this report gives the decrease per 1,000 living, as 7.2; i. e., there was 7.2 more deaths than births per thousand in 1928-29. The same report gives the decrease for the whole Mandated Territory of New Guinea (excluding Aitape, Morobe and Salamaua) as 3 per thousand for 1928-29. While none of the figures are adequate, they are sufficient to indicate a declining population. The group on which 161

[23] Another study on a different primitive people has, however, revealed no excess of masculinity in the total population of a declining people. See Hogbin, H. I., The Problem of Depopulation in Melanesia as Applied to Ontong Java. *Journal of the Polynesian Society*, Vol. 39, No. 1, p. 57.

[24] Pitt-Rivers, G. H. L. F.—The Clash of Culture, *London*, 1927, p. 20.

[25] *Ibid.*, p. 20.

[26] *Ibid.*, Tables 1 and 2, given in Appendix VI, reproduced from Statistics relating to Commerce, Native Tax, Population, etc., in connection with the late German New Guinea Possessions, published by the Government of the Commonwealth of New Guinea.

[26] Anthropological Report, No. 6. Territory of New Guinea. Introduction. (In press.)

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

161 the statistics in this paper are based is a small unit in this declining people.

By the use of the genealogical method in a study of 455 women, it was possible to compare one generation or age group with another. It was found that there has been an increase in deaths before marriage during the last three generations, and that this increase has taken place during infancy. Since the birth rate is small and not increasing, it is evident that these people must be declining in population.

114 To discover why more deaths are occurring in infancy is not easy. The causes of death are not known to the natives and there is no gov-
165 ernment station near enough for any autopsies to be made. All one can do in addition to presenting the factual material is to point out the non-existence of certain causes and to posit, very tentatively, any possible ones. Such factors as feeding and the care of the infant may be ruled out. The infant receives the same care and the same food today that he did three generations ago. The fact that an infant only a few days old is given baked taro to eat happened also several generations ago. Also, there has been no change in the habits of work, or the manner of living in general, for the pregnant woman and for the mother while she is nursing her infant. At birth, there was in the past and still is today, a dependence on the skill of a few native women. The report of a conference called by the Commissioner for Native Affairs and attended by the Director of Public Health and by the representatives of Mission Stations in the Territory, seems to the writer to be quite erroneous in regard to the causes for an increase in infant mortality. The conference was of the opinion "that the high rate of infant mortality is due to:

(*a*) The too early marriage of many women.
(*b*) Undernourishment and improper feeding of infants.
(*c*) Undernourishment of people generally, due to an ill-balanced diet, and in some cases to food shortage.
(*d*) A lack of cleanliness on the part of those handling and feeding infants.
(*e*) Epidemics, e. g., whooping cough.
(*f*) Infanticide." [27]

It has already been shown that for the people on whom this study is made, the conditions indicated by a, b, c, d are exactly the same now as

[27] Report to the Council of the League of Nations on the Administration of the Territory of New Guinea, from July 1st, 1926 to the 30th of June, 1927, *Canberra*, p. 115.

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

they were in the past, and that while they may be a cause for a high rate of infant mortality they cannot be considered as a cause for an increase in the rate. Epidemics might reasonably be a factor, and there was an influenza epidemic in 1918 and a famine in 1914, due to drought, in New Ireland. There is no record of how many deaths, or the ages of those dying from either influenza or the famine, so that they can only be considered in a general way. The last cause mentioned by the conference, namely infanticide, does not exist now and did not in the past, as far as one was able to observe, among the people on whom this study is based.

Psychological causes for a decline in native populations have been suggested by W. H. R. Rivers and G. H. L. Pitt-Rivers. The former, in his discussion of the conditions which have affected increasing death rates and decreasing birth rates, mentioned the following: the introduction of diseases, of alcohol and opium, of firearms, of European garments, of modified housing, and finally, modifications and interferences with native customs.[28] Dr. Rivers emphasized the last point particularly and believed that the destruction of native institutions deprived the natives of their interest in life. Continuing his discussion of the increasing death rates, he said, "The special point I wish to make in my contribution to this book is that interest in life is a primary factor in the welfare of a people. The new diseases and poisons, the innovations in clothing, housing and feeding, are only the immediate causes of mortality. It is the loss of interest in life underlying these more obvious causes which give them their potency for evil and allows them to work such ravages upon life and health." [29] When he considered the decline in birth rates he again emphasized the significance of mental factors, and thought that the same loss of interest in life might be of importance in

[28] Rivers, W. H. R., Essay, "The Psychological Factor," in *Essays on the Depopulation of Melanesia*, edited by the same author, Cambridge, 1922, pp. 89-95. Alcohol, opium and firearms are not used by the natives of this study. The men now wear loin cloths when formerly they were naked, and have acquired a consciousness of their bodies which they lacked in the past. The women wear loin cloths also, instead of the straw aprons formerly worn, and they are supposed to wear blouses. The blouse comes off when they are working, and frequently at other times too. Dr. Rivers' point that the natives keep their bodies clean, but not their acquired clothing, applies to these people. The houses have not been modified by European influence. The other two factors, the introduction of diseases and the modification of native customs, are discussed in the text.

[29] *Ibid.*, p. 96.

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

121 accounting for it. He wrote, "We have here only another effect of the loss of interest in life which I have held to be so potent in enhancing mortality. The people say themselves: 'Why should we bring children into the world only to work for the white man?' " [30]

Pitt-Rivers has emphasized still more strongly the influence of psychological factors from another point of view and suggests that the destruction of cultural institutions such as magic, economic structure, etc., results in boredom or loss of the *joie de vivre*, which in turn might operate to exterminate a race.[31] He thinks that even though there be normal sexual intercourse, the woman might not conceive because her emotional life had been disturbed, which he would trace to the break up of the native culture through white contact.[32]

105 114 121 177 182 The writer of this paper would not deny the possible influence of these psychological factors when they were operative, but the point is that the psychological factors mentioned by Dr. Rivers and by Pitt-Rivers are not present among the people on whom this study was made and therefore cannot be adduced as a cause for their decline. The fundamental aspects of the native culture have not been broken up, and these people are not bored, nor have they lost their *joie de vivre*. Although there has been a fair amount of white contact, and cannibalism and warfare have been abolished by the mandated government, their kinship organization, economic structure, ritual and sexual life, are still actively functioning according to their traditional custom. The people are busy with their daily work (gardening and fishing) and with preparations for the many ritual feasts and dances. They flirt, marry, and have their *affaires du coeur* in a very happy, casual fashion and do not, as Dr. W. H. R. Rivers suggests, ask themselves why they should bring children into the world. They are, as far as can be observed, quite happy, decidedly not bored, and have a real interest in life.

177 The psychological factors mentioned by the two authors just quoted may be operative on the generation of children now growing up. Many of these have been to mission schools, where they are given the concept of shame in connection with sexual matters, particularly in regard to extra-marital intercourse, which is a very indigenous part of their culture. White contacts are increasing and it is probably only a matter of time before the native culture will be broken up. What the

[30] *Ibid.*, p. 104.
[31] Pitt-Rivers, G. H. L. F.—*The Clash of Cultures*, London, 1927, pp. 142-148.
[32] *Ibid.*, pp. 146-147.

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

psychological effect of this will be on the birth and death rates of future generations can be, at the moment, only a matter of conjecture.

It is thus necessary to point out that while these psychological factors may be of significance in accounting for a declining population, they are not present among this particular declining people. The adult women on whom this study was made have not been to mission schools and the effect of mission teaching on them is very superficial. The fundamental aspects of their culture have not been destroyed and they have not lost their interest in life.[33]

There is one factor, mentioned by Dr. Rivers but not stressed, which might tentatively be considered as a possible cause for the decline in population, and that is the introduction of the so-called "white man's diseases." While there are no medical records for the group of people on whom this study was made, there are some fragmentary medical records for the whole Mandated Territory of New Guinea, which includes New Ireland.[34] These are based on treatments in native hospitals at the European centers and the natives are mostly indentured laborers from all over the territory. The records can be used to indicate that certain diseases exist in the Territory, some of which appear more widespread than others. It is of interest to note here those that might have any influence on infant mortality.

The reports all mention tuberculosis as being rather widespread. We are told that "tuberculosis, pneumonia and other respiratory diseases cause approximately 50 per cent of all native deaths in Rabaul," and that these diseases are new among these native races.[35] In 1926-27 tuberculosis accounted for about 32 per cent of the total deaths of natives in the series under review.[36] In 1927-28, 103 cases of tuberculosis were treated in native hospitals, and these cases had a mortality rate of 33 per cent, accounting for 13 per cent of the total mortality of hospital cases.[37] In 1928-29, 57 per cent of all the native deaths occurring in native hospitals were due to tuberculosis, pneumonia and dysentery.[38]

---

[33] In the writer's forthcoming book, the life of the society as it is functioning today will be described in detail. The contact of other cultures will not be neglected and an attempt will be made to evaluate the effect of this contact.

[34] Reports to the Council of the League of Nations on Administration of the Territory of New Guinea, *Canberra*.

[35] *Ibid.*, 1924-25, p. 17.

[36] *Ibid.*, 1926-27, p. 133.

[37] *Ibid.*, 1927-28, p. 89.

[38] *Ibid.*, 1928-29, p. 26.

4: Powdermaker B-5 (1929-1930) 1931 QM10 New Ireland OM10
Law

164 From this evidence it would appear that tuberculosis is fairly widespread. The effect of tuberculosis in increasing infant mortality has already been pointed out.

164 342 Housing conditions are of importance in this connection. The house consists of one room, with walls of bamboo, a thatched roof, and the beaten ground as a floor. There are no windows and just one door, which is usually kept shut when no one is in the house. It is quite impossible for any sun to get inside the house. While the native spends most of his time outdoors, he sleeps indoors and is there when it rains. Sputum is carelessly deposited on the ground, which serves as the floor, and babies crawl around on this ground. It is obvious that the infant is brought into very close contact with foci of infection.

164 The reports to the League of Nations also indicate that gonorrhea is widespread. In 1928-29, 297 males and 145 females were treated and more than half of the cases from the whole of the Mandated Territory were in New Ireland.[39] The report for 1924-25 says that "The central campaign of the year was that devoted to the combatting of gonorrhea. Over a thousand natives in all were treated for the disease, but owing to the lack of funds the campaign was unable to be pushed to a satisfactory conclusion."[40] Since gonorrhea is usually held to be the cause of a large percentage of sterility,[41] it is possible that this disease might be a cause for the increasing sterility among these women.

Syphilis is not mentioned in the Reports to the League of Nations, but this does not necessarily mean that the natives do not have the disease. The reports on autopsies performed give such causes of death as tuberculosis, dysentery, pneumonia, tropical ulcers, enteric fever, miscellaneous septic conditions, etc. It is quite possible that a native suffering from any of these might have syphilis at the same time, but that it might not be considered the cause of death. Particularly might this be so, since it is common knowledge that syphilis exists among the natives, even if one can get no statistics on the matter. If three or four boys leave their village to work in the white man's capital, or on some large plantation and return with syphilis, it would not take long for the disease to spread, in view of their rather promiscuous sexual life. The

[39] Report to the Council of the League of Nations, etc., 1928-29, p. 26.
[40] *Ibid.*, 1924-25, p. 17.
[41] Graves, W. P.—Gynecology, *Philadelphia*, 1928, p. 668. "Gonorrhea, of all the inflammations that attack the tubes (fallopian) is by far the most destructive of fertility."

4: Powdermaker E-5 (1929-1930)1931 OM10 New Ireland OM10
Lesu

possible connection of syphilis with reducing the birth rate and increasing the number of deaths due to accidents of pregnancy has been noted. 164

The difficulty with most theories accounting for the decline in native populations is that there is very little factual material to prove them. 161 But it would seem from statistics presented in this study made through genealogies, that one small group of a declining people is being exterminated because a large per cent of their offspring are dying in infancy and therefore do not have a chance to reproduce themselves. The physiological causes for this increase in infant mortality are suggested only tentatively, since there are no adequate medical records, and because the writer is not a physician and could make no medical investigation. However, a thorough study of the effect of introduced diseases might reveal much information on the causes for the decline of these people.[43]

---

[43] I am indebted to M. Powdermaker for making the charts accompanying this article.